#### February 2018

# nt SSEPTA

#### **Progress Updates:**

- Monthly Meetings are held with representatives from Operations, Training, Vehicle Engineering & Maintenance, Communications & Signals, and System Safety
- Quarterly Meetings are held with the General Manager and Deputy General Manager

#### **Committee Members:**

- Jeffrey Knueppel, P.E.,
   General Manager
- Rich Burnfield, Deputy
   General Manager
- Scott Sauer, AGM Operations
- Ron Hopkins, AGM Vehicle
   Engineering and Maintenance
- Jim Fox, AGM System Safety
- Stephanie Deiger, AGM
   Employee Development and
   Relations
- Tracy Innaurato, Director
   Training & Development
- Mike Monastero, Chief
   Engineering Officer
   Communications & Signals
- Kevin Jurgelewicz, Director
   Planning and Control Center
   Coordination

#### **Overview**

SEPTA has been working continuously to improve our safety culture, but following three incidents last year on the Norristown High Speed Line (NHSL), Trolley lines, and Market Frankford Line (MFL), the Authority made the decision to look closely at our operations, evaluate current programs and procedures, and identify how/where to make comprehensive improvements furthering safety as our top priority.

The General Manager and his team reviewed each mode, and grouped the necessary efforts into the 5 categories below, creating SEPTA's Operational Safety Improvement Program, (OSIP).

A separate Regional Rail Service Improvement Program is available to customers online, and has been updated on a consistent basis since December 2016.



**Organizational Changes** 



#### **Structural Changes**

Over the years, the Operations Division had grown to include many functions and responsibilities. Effective September 15, 2017, the Operations structure was changed to focus exclusively on **service delivery**, **customer service**, **operational safety**, **rules enforcement**, and **employee engagement**.

Vehicle Engineering and Maintenance is now a separate Division. They play a critically important role in sustaining and building ridership by improving the safety and reliability of our existing fleets and introducing new vehicles.

General Manager

Assistant General Manager, Operations Assistant General Manager, Vehicle Engineering and Maintenance

#### **Organizational Changes**

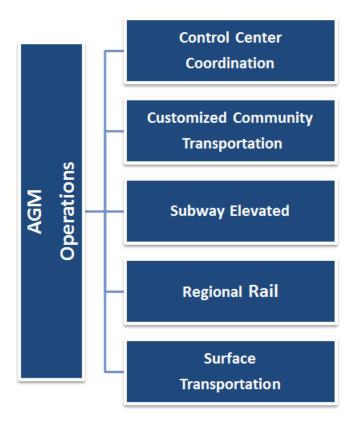


#### **Structural Change Details**

Scott Sauer, previously Assistant General Manager (AGM) of System Safety transitioned to AGM of Operations. Scott brings 27 years at SEPTA, with extensive safety experience, and first hand frontline Surface and Subway Elevated Operator experience. All four modes — CCT, Regional Rail, Subway Elevated, and Surface — now report to him.

Jim Fox, previously Chief Control Center Officer, transitioned into AGM of System Safety to manage the Authority's comprehensive focus on customer and employee safety. Before his tenure in the Control Center, Jim served as the Director of System Safety. This position was elevated to Assistant General Manager, System Safety in 2015 to further the Authority's focus on safety.

Ron Hopkins, previously AGM of Operations and a trained mechanical engineer, transitioned into the newly created AGM of Vehicle Engineering and Maintenance role with responsibility for the Authority's 1,400 buses and 1,000 rail cars. One of his main roles is to improve the safety and reliability of our existing fleets and introduce new vehicles.



#### **Cultural Changes**



#### **Safety Culture Enhancements**

Moving forward into 2018, SEPTA is undertaking the following initiatives to enhance the Authority's practice of being *Never Too Busy For Safety*, an employee focused program which was started in 2012:

- SEPTA intensified the efforts of the existing **Safety Culture Working Group**. The purpose of the group is to bring individuals from various departments throughout the organization to work on ways to drive and enhance the safety culture to every level of the organization.
  - This year, the Annual Safety Summit will include sessions for all SAM and hourly employees. Sessions for field employees will be held at reporting locations during all shifts.
  - Safety Culture Testimonial Videos featuring SEPTA employees will be shown during the 2018 Safety Summit as a way to highlight how employees prioritize safety every day.
  - A SEPTA bus is being retrofitted into a mobile Safety Bus.
    The Safety Bus will include information about safety best
    practices. The bus will be utilized during the 2018 Safety
    Summit and at future SEPTA Safety events.



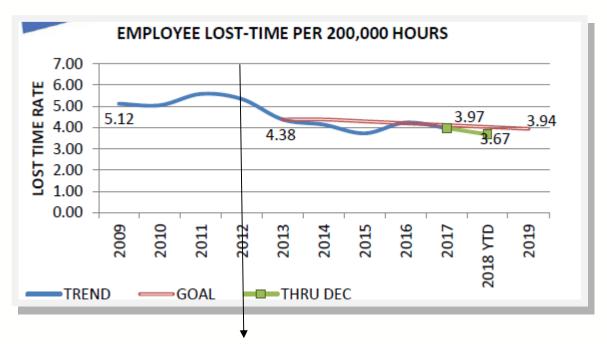
- This group has developed an employee safety culture survey that will be distributed to all
  employees during the internal safety day held in February.
  - This survey will serve as the base line for the organization to gauge where we are currently and what specific areas we need to focus on to continue to enhance our organizational culture toward safety.
  - Results of the Safety Culture Survey will be communicated to all employees during the 2018 Safety Summit, scheduled for April 2018.

#### **Cultural Changes**



#### **Safety Culture Enhancements**

Intensified efforts are evident as SEPTA continues the journey to reduce employee injuries. The 30% reduction in incidents since 2009 represents a strong downward trend towards meeting this goal.



Never Too Busy for Safety campaign starts

#### **Organizational Culture Enhancements**

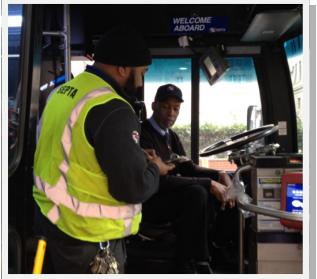
- Leading Cultural Change (*Employees are more than a number*): The General Manager has selected 6 members of his GM Team to work with an organizational development consultant to develop corporate strategies that will help to unify the organization. Some of the key areas of focus are;
  - Ensuring that employees are more than a number, feel valued, and engaged.
  - Safety is not a management or labor issue, it's something we can all get behind.
  - Make all employees comfortable to raise concerns and highlight issues without fear of retaliation, especially regarding safety.

#### **Training Enhancements**

One of SEPTA's main focuses is to review our current training, and make programmatic improvements across the board. This will include training program enhancements, including the continued roll-out of the vehicle simulator program.

#### **Training Program Enhancements**

- Training program review by an outside consultant: UNDERWAY.
  - Preliminary consultant report is due to SEPTA by February 28, 2018.
- Review of operator signal violation histories with immersion training for certain employees. COMPLETED.
- Schedule rail operators for brake procedure refresher training by October 15: COMPLETED.
  - Scenarios include: brake failure, slippery rail, and emergency stops.
- Norristown High Speed Line operator training changes:
  - Meeting occurred between Labor Relations and Chief Officer of Surface Transportation on December 20, 2017:
    - Discussed the possibility of changing the initial operator new hire training at Victory
      District, whereby, new hires would be assigned a particular mode (Bus, MSHL, NHSL).
      Once they complete training they would be assigned to that mode for 7 months or up to
      one year. This would allow operators to become more familiar with a specific mode,
      improve their technical competencies, and position them for success.
      - Labor Relations and Surface Transportation to discuss any possible issues with the Training department.
  - Follow up meeting with Operations, Training, SMART Local 1594, and Labor Relations scheduled for the end of February, 2018.



#### **Training Enhancements**

#### **New Hire Training and Recertification**

To remain proactive while the outside consultant work is ongoing, the Training Department moved ahead to develop an independent plan to revitalize and enhance Operator New Hire and Recertification Training. Training will refine the program as the consultant results are received.

- Their effort includes creating a longer initial operator training program and a more intensive recertification process for both City and Suburban personnel. Overarching changes to the program include:
  - Adding an additional day of recertification training that will focus on troubleshooting, unusual scenarios, yard moves when appropriate, and terrorism including active shooter.
     Material covered during this day will be dynamic depending on the needs of the operation.
  - Adding additional days to the new hire training programs for each mode to devote additional attention to signals, troubleshooting, night work, weekend work, crowded conditions and schedules.
  - Assigning Trainers to work with new operators during their first week of revenue operations.
  - Creating a position for instructional designer/program developers whose sole responsibility will be creating and updating technical training content using technology and modern training tools, and who will be able to act as a liaison with Operations.
- As a result of this training enhancement plan, the General Manager has approved the immediate hiring of an additional five Trainers.

	Current Program Length	Proposed Program Length	Additional Days	
Market Frankford Line				
New Hire	30	36	6	
Recertification	1	2	1	
Broad Street Line				
New Hire	30	36	6	
Recertification	1	2	1	
Media Sharon Hill Line				
New Hire	25	30	5	
Recertification	1	2	1	
Norristown High Speed Line				
New Hire	25	30	5	
Recertification	1	2	1	
Callowhill				
New Hire	50	54	4	
New Hire	20	23	3	
Recertification	1	2	1	
Elmwood				
New Hire	50	54	4	
New Hire	20	23	3	
Recertification	1	2	1	

Training Program	Additional Trainers Needed
Recertification	1.5
New Hire Training	1.5
Curriculum	1
First Week with Operators	1
TOTAL	5

#### **Training Enhancements**

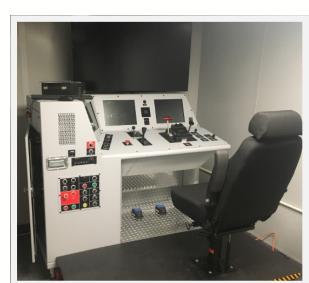


Starting in 2016, SEPTA began the process of acquiring railroad simulators, giving engineers the ability to experience non-routine operating scenarios that may not otherwise be experienced in actual operations, (e.g. slippery rail practice). The program is ongoing, and has been further expanded.

- The Simulator program began with Regional Rail, and is currently being expanded to include all rail modes.
- Creation of a new Chief Instructor, Rail Simulators position. **COMPLETED**.
  - Role filled by Baron Eberenz, former Rail Instructor.
- Phase 1—Regional Rail:
  - Ten (10) new simulator rooms were added to SEPTA's training area, located on the third floor of 1234 Market.
  - Seven (7) railroad simulators have been acquired: 2 Silverliner IV, 2 Silverliner V, 2 ACS-64
    Engines, 1 Diesel
    - **December 18-20**: The Diesel and ACS-64 simulators were delivered to SEPTA and hard wired. The instructor station was also installed.
    - The complete testing of the installations began in the first week of January, 2018.

• **February 24, 2018**: Delivery of the Silverliner IV and Silverliner V simulators scheduled.

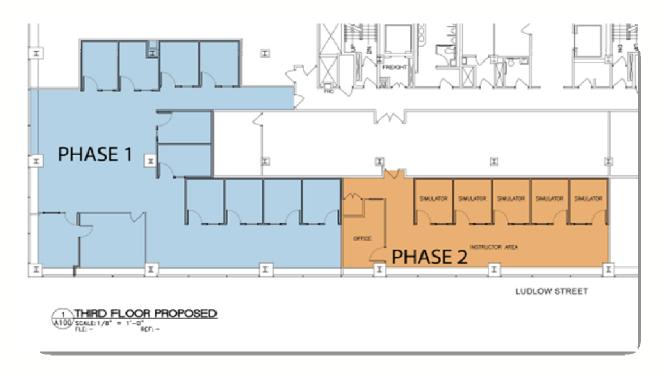
Total Phase 1 Cost: \$2,125,000



#### **Training Enhancements**



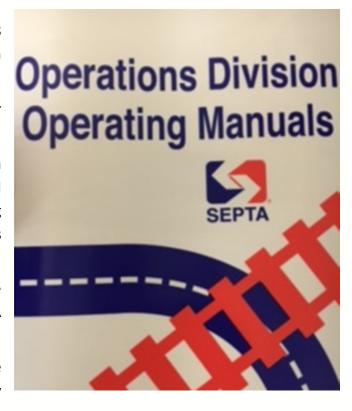
- Phase 2—Rail Transit:
  - Initial cost and time line estimates for the expansion of the simulator program to other modes are as follows:
    - Norristown High Speed Line (N5) First Delivery May 2018
    - Broad Street Line (B4) First Delivery July 2018
    - Market-Frankford Line (M4) First Delivery November 2018
    - LRV (Single/Double End) First Delivery February 2019
  - Initial Phase 2 Cost Estimate: \$3,152,122.



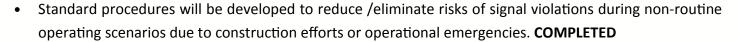
#### **Rules & Procedural Changes**

Rules and procedures are being examined across all modes to identify areas where risk can be eliminated and operational changes can be made in order to improve safety.

- SEPTA is conducting a review of the rulebook as well as the Rules Committee structure and process. This involves:
  - Authority Rules Committee (ARC) met on November 28 to establish new members due to the organization changes.
    - The Director, Planning and Control Center Coordination acts as the Chairperson for ARC.
    - ARC meetings will be held on a minimum quarterly schedule, and sub-committees will meet on a monthly basis. The first ARC meeting was held in January, 2018. The next meeting is scheduled for April, 2018.
    - Sub-committees were formed to fully examine each modal rulebook beginning January 2018. A member of ARC will sit on each sub-committee.
      - 12 Sub-committee groups in total are being formed. The first seven are: Subway Elevated, Regional Rail, Trolleys, Bus, Customer Service, Roadway Worker and Safety Rules.
      - Subway Elevated sub-committee is the first one ready, and is based on the signal/ speed reduction working group. First meeting scheduled for February, 2018.
      - Regional Rail and Roadway Worker Protection are targeted for March, 2018.



#### **Rules & Procedural Changes**



- Further updates provided in the Signal Violation section.
- Risk assessments are performed prior to gaining approval for a planned single tracking event or similar change made to routine operations. ONGOING.
  - On the Market Frankford Line, first it is determined if stop and proceed can be used, then where it should be granted, and only by the on-site Transportation Manager.
  - On the Route 100, short term outages are evaluated with a risk assessment. In 2018 work is scheduled to create universal interlockings at Wynnewood and Bryn Mawr such that operators no longer have to make "Z" moves.
  - For the Routes 101 and 102, outages are being condensed to weekend busing to correlate with the CBTC related work.
  - The Broad Street Line outages are being addressed in the long-term by the Subway Elevated/Signal Violations working group.
    - All major outages are being reviewed prior to approval.
- Roadway Worker Protection efforts will be reviewed by a consultant working with the System Safety Department in 2018. UNDERWAY
  - Roadway Worker Protection is the next sub-committee meeting to be formed by ARC.
- Process for reporting Slippery Rail conditions to engineers/operators in a proactive manner. COMPLETED
  - The Control Center is currently undertaking this process, and Standard Operating Procedures (SOP) have been updated.
    - Changes to the SOP dictate that once an Engineer reports Slippery Rail Conditions, the Control Center shares this with all similar and/or nearby modes.
- NHSL and MFL Stop and Proceed rules changed on September 23, 2017.
   COMPLETED



#### **Rules & Procedural Changes**



#### **Internal Audits and Reviews**

System Safety, in conjunction with Transportation and Vehicle Maintenance, is conducting regular in-house audits in order to ensure that operational changes made under the OSIP are being followed through on. In-house audits include:

#### Regular black box audits and reviews:

• Daily compliance checks from two NHSL cars each day to evaluate operator train handling and ensure operators are not accelerating into reduced speed track circuits.

#### Regular audits of sanders:

- Operators are required to inspect sanders as part of their pre-trip vehicle inspection.
- Supervisors are conducting random audits of vehicle sanders.

#### Review of safe following distance for light rail vehicles:

- Operations, System Safety and Pennsylvania's State Oversight (PRTSRT) have increased rules compliance audits for close following distances of light rail trolleys in street operation. These audits are performed regularly each month.
- SEPTA is working with PennDOT (SSOA), FTA, on a technical research program for a safe following program. More detail is provided under the technology review.

#### • Signal compliance testing audits across all modes:

- System Safety, in conjunction with Operations, has elevated the number of signals compliance audits conducted on all modes.
- In excess of 200 audits conducted since July, 2017.

#### ATC cutout bypass switch audits:

- Daily inspections performed by Vehicle Maintenance personnel during morning car makeup for all safety seals.
- Additional platform audits conducted by Operations supervision to ensure seals are in place throughout the day.

#### **Technology Review**



#### **Speed Restrictions**

After the NHSL Collision, a number of temporary restrictions were put into place, until thorough testing of the signal system and vehicle enforcement could be completed:

- All vehicles are now required to make a station stop at Township Line Road Station (1.5 miles out of 69th Street Transportation Center). Additionally, speed restrictions (55MPH to 30MPH and from 30PMPH to 15MPH) were instituted from the approach to Township Line Road Station and then the downgrade to the yard limit at 69th Street Interlocking, (speed command changes made).
- Maximum speed reduced to 55 MPH from 70 MPH on the line, (speed command changes made).
- Speed restricted to 45 MPH when not stopping at station.

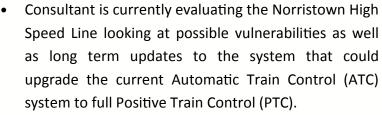
Effective December 25, a speed restriction of 30 MPH was put in place on the Media Sharon Hill Line for the entire 1.5 mile length of the single track between Woodland Avenue and Smedley Park, until completion of the CBTC project. Anticipated addition of 2 minutes in run time, going from 50 MPH to 30 MPH.



#### **Technology Review**



Currently, SEPTA's signal system and enforcement interaction with vehicles are being reviewed by outside consultants. To create a standard for City and Suburban signal/vehicle safety, FRA guidelines are being used as a starting point, combined with industry best practices, consultants, and other agencies.





- Analysis of cars and wayside. COMPLETED
- Developed braking curve. COMPLETED
- Vulnerability assessment and recommendations for modifications. UNDERWAY
- Define "Transit Positive Train Control". UNDERWAY
- Gap to "Transit Positive Train Control" analysis. UNDERWAY
- Similar efforts for other modes will be revised based on characteristics, (Broad Street Line, Market Frankford Line, and the Trolley Tunnel).
- Signal System logic has already been revised at the MFL loop track to prevent two trains from being routed to the same loop track whether in automatic or local control.

Mode	Signal System	
Market Frankford Line	Automatic Train Control	
Norristown High Speed Line	Automatic Train Control	
Regional Rail	Positive Train Control	
Median Sharon Hill Line	CBTC under construction	
Trolley Tunnel	CBTC	
Broad Street Line	Tripper System	

#### **Technology Review**



#### **Broad Street Line**

A working group comprised of Operations, Training, and System Safety representatives convened in late November, 2017, and has been meeting weekly to develop recommendations to enhance safety on the Broad Street Line. The working group studied 2017 violations including location, circumstances, and operator suggestions to develop the action items below.

- Beginning in January, 2018 an increase of supervisory audits and observations was made in identified violation "hot spot" areas.
- Use video from on-board cameras for after-action review and operator mentoring in cases of signal violations and/or near-miss reports.
- Make significant changes in Maximum Authorized Speed (MAS):
  - Draft of an updated version of the published MAS based on Vmax for each track will be completed in early March.
- Wayside signage for speed changes:
  - Establish a quarterly cleaning program for permanent wayside operator signs and signal lenses, beginning in Spring 2018.
  - After initial cleaning, inspect existing signs for accuracy and add/correct where needed.
  - Standardize purpose of signage: in-gage and/or track area signs are for temporary application, and all wayside signs mounted at or above the operator's line of sight are for permanent information.
  - Display each permanent speed change per track.

#### Auto-Routing:

- Auto-route feature should be disabled and require manual push-button for diverting route selection by the operator between Erie and Fairmount, kick-off of this initiative is scheduled for early March.
- Identify key locations for installation of mirrors to allow operator's to see route light displayed on front of train.

#### **Technology Review**



- Speed on approach to bumpers:
  - On Tracks 2 and 3 south of Walnut-Locust, install operator push-button for southward movements on the approach to the bumpers (similar to current operation at AT&T).
    - The Communications & Signals department is working on the design, material acquisition is in progress, with installation and cutover anticipated for early summer 2018.
- Terminal Departure Announcements:
  - Based on suggestions received, require operators to perform a departure announcement prior to closing doors at terminal points.
    - Example: "We have received our signal to depart, please step in, doors are closing and we will be on our way".
- Improve radio protocol and emphasize clear and correct repeat of safety instructions.



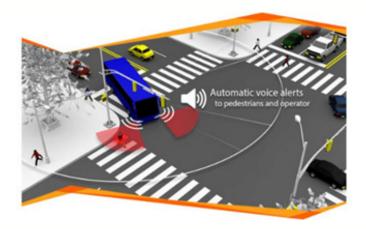
#### **Technology Review**

#### **Safety Technology**

The System Safety Division is working to bring industryleading technology to further enhance SEPTA's safety culture across all modes. These technologies include:

- Roadway Worker Protracker: This system has a sensor on each of the cars and communicates with an armband sensor to warn the roadway worker of the approaching train.
  - The Protrackers are currently in use on the Norristown High Speed Line, and are being piloted on Regional Rail.
- Bus Alert Turn Warning: The system provides an audible alert on the outside of the bus to warn people around the vehicle anytime it changes lanes or is making a turn.
  - To date, 377 vehicles are equipped with the Alert Turn Warning with all buses scheduled to be completed by 2019.
- Blind Spot Awareness System: The awareness system is intended to scan out in front of a bus across a 180 degree field of view and alert the operator something is approaching too close to the bus.
  - Two prototype units have been developed and have been installed on 2 SEPTA buses, bus 8682 at Comly and bus 8279 at Midvale.
  - SEPTA is actively working with the vendor to address engineering issues during the pilot phase.





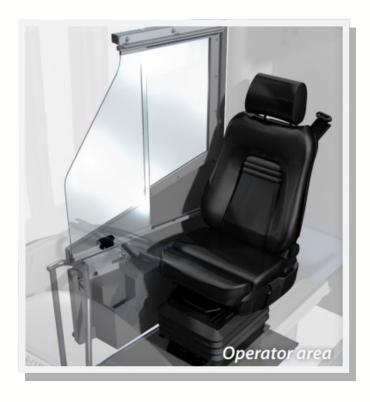


#### **Technology Review**



#### **Safety Technology**

- **Trolley Separation Research Program**: Establish a system that would monitor the distance between trolleys out in mixed traffic and provide enforcement to prevent two trolleys from getting too close to each other.
  - Initiative is currently in the research stage and SEPTA has begun working with a vendor.
  - This is a collaborative effort between SEPTA, PennDOT, and the FTA.
- **Bus Operator Protective Enclosures**: In order to provide increased transit operator safety, SEPTA's Vehicle Engineering Department determined that the bus fleet's operator enclosure should be evaluated.
  - The Vehicle Engineering & Maintenance Department is working with Arowguard to install their system on select buses to be evaluated by operators in revenue service.
  - An initial pilot is scheduled for April or May, 2018.





**Technology Review** 





SEPTA's Video/Surveillance Department has completed the installation of Forward Facing/Inward Facing cameras set on the Regional Rail and Subway Elevated fleets within the operating cab compartment.

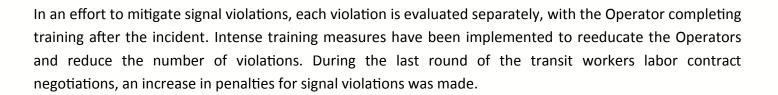
#### Regional Rail

- Silverliner V: 120 cars completed
- Silverliner IV: 231 cars completed
- Coach Cars, Locomotives, Work Cars:
   64 cars completed

#### Subway Elevated

- Broad Street Line: 125 cars completed.
- Market Frankford Line: 206 cars completed.
  - Only 14 cars remain that are out of service for major repairs. They will be equipped prior to return to revenue service.
- Bus, Trolley, and NHSL fleets are fully installed.
- These cameras also have audio capabilities.

#### **Signal Violation Reduction**



#### **Signal Immersion Program**

- Starting in 2017 former Senior Director Subway Elevated Transportation, Mike Kolesnik, began a Signal Immersion Program for Operators who are repeat signal violators. Topics include:
  - Discuss employee's personal responsibility & personal liability.
  - Review train accidents from various other transit authorities.
  - Recount recent SEPTA events.
  - Provide flashcards illustrating the wayside signal or work/slow zone sign to each employee.
  - Quiz to test knowledge on identifying wayside signals and work/slow zone signs.
- Immersion sessions began in late September for the Broad Street Line, and mid-November for the Market Frankford Line.
  - BSL: Emphasis on the "Approach" signal and sign, how the operation of the interlocking effects the signals before and after, and how it gives block protection.
  - MFL: Emphasis on "Stop and Proceed" button and how activation can lead to violations, derailments, and collisions.



### Make the Safe Choice

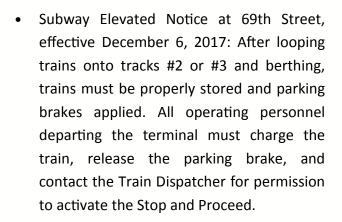
#### **Signal Violation Reduction**

Over the past several months, Operations, working in conjunction with System Safety, Communications & Signals, and Training have implemented a series of initiatives focused on signal violation reduction.

- Monthly meetings with the General Manager
- The Signal Blitz Campaign
- Operation Awareness
- Reminder signs at 69th Street and Frankford Transportation Center terminals
- Union involvement, roundtables and Location Safety Committee discussions
- Post violation coaching and reinstruction
- Signal immersion class
- Training bulletins focusing on signals, signal rules, and compliance
- Organizational "Road Map for the Future" goals set
- System Safety routine rules checks
- Subway/Elevated ARC Sub-Committee also regularly reviews Signal Violations, and makes recommendations to the ARC Committee where necessary.



**Signal Violation Reduction** 



- Interlocking improvements underway to create universal interlockings. Schedule includes:
  - CY 2018: NHSL interlockings
     Wynnewood and Bryn Mawr
- Discussions and feasibility review underway to add audible warnings to hot spot locations, "Here comes your signal."

### Work Slow Zones







- Understand the sign's information
- Be alert in work/slow zones
- Be prepared to stop
- Be alert for workers in/near track areas
- Operate according to the required speed
- Know where work/slow zones are posted prior to each trip
- If uncertain of how to proceed contact the Control Center



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- · Understand posted signs
- Be Alert
- Operate according to procedures outlined in the rule book